AMENDMENTS TO THE CLAIMS:

Please amend Claims 1-11 as set forth below. The Claim listing below replaces all prior versions of the claims in the application.

1. (Currently Amended) ~~A system~~ An apparatus for providing attitude control with respect to a spacecraft, comprising:

at least one memory element; and

a processor configured to execute a set of instructions stored on the at least one memory element, the set of instructions for:

~~first control logic configured to adjust~~ adjusting a plurality of reaction wheel assemblies associated with the spacecraft in order to control the attitude of the spacecraft, and

~~second control logic configured to use~~ using a plurality of gimbaled thrusters associated with the spacecraft to control the momentum associated with adjusting the plurality of reaction wheel assemblies,

wherein the ~~first control logic is configured to modify adjustment to~~ adjusting of the plurality of reaction wheel assemblies is based on a torque deficit of ~~associated with~~ the plurality of gimbaled thrusters.

2. (Currently Amended) The ~~system~~ apparatus of claim 1 wherein the plurality of gimbaled thrusters include a plurality of gimbaled Hall Current thrusters (HCTs).

3. (Currently Amended) The ~~system~~ apparatus of claim 2 wherein using the plurality of gimbaled HCTs to offset the momentum associated with adjusting the plurality of reaction wheel assemblies during an orbit transfer results in minimal HCT gimbal stepping.

4. (Currently Amended) The ~~system~~ apparatus of claim 1 wherein the spacecraft includes a satellite.

5. (Currently Amended) Flight software having one or more instructions configured to effect the ~~system~~ apparatus as recited in claim 1, wherein the flight software resides on a computer-readable medium executable by a processor onboard the spacecraft.

6. (Currently Amended) ~~A system~~ An apparatus for providing attitude control with respect to a spacecraft, comprising:

at least one memory element; and

at least one processor configured to execute a set of instructions stored on the at least one memory element, the set of instructions for:

adjusting, using a reaction wheel control module, ~~configured to adjust~~ a plurality of reaction wheel assemblies associated with the spacecraft in order to control the attitude of the spacecraft, and

using a maneuver control module ~~configured to use~~ on a plurality of gimbaled thrusters to control the total momentum of the spacecraft, the total momentum including the momentum associated with the plurality of reaction wheel assemblies during an orbit transfer,

wherein ~~the reaction wheel control module is configured to modify adjustment to~~ adjusting the plurality of reaction wheel assemblies is based on a torque deficit of ~~associated with~~ the plurality of gimbaled thrusters.

7. (Currently Amended) The ~~system~~ apparatus of claim 6 wherein the plurality of gimbaled thrusters include a plurality of Hall Current Thrusters.

8. (Currently Amended) The ~~system~~ apparatus of claim 6 wherein using the plurality of gimbaled thrusters that control the momentum associated with the plurality of reaction wheel assemblies during the orbit transfer results in minimal gimbal stepping.

9. (Currently Amended) The ~~system~~ apparatus of claim 6 wherein the spacecraft includes a satellite.

10. (Currently Amended) Flight software having one or more instructions configured to effect the ~~system~~ apparatus as recited in claim 6, wherein the flight software resides on a computer-readable medium executable by a processor onboard the spacecraft.

11. (Currently Amended) The ~~system~~ apparatus of claim 6 wherein the maneuver control module further includes a momentum adjust module and a gimbal module;

wherein the momentum adjust module is configured to receive information relating to the speed of the plurality of reaction wheel assemblies and a momentum command as input and generate a plurality of outputs including a first output relating to a reaction wheel momentum adjust torque, a second output relating to a thruster momentum adjust torque and a third output relating to an integral momentum adjust torque;

wherein the gimbal module is configured to use the second and third outputs from the momentum adjust module to generate a plurality of outputs including a first output relating to a torque deficit and a second output to be used to control the plurality of gimbaled thrusters; and

wherein the reaction wheel control module is configured to use the first outputs from the momentum adjust module and the gimbal module respectively to generate an output to be used to control the plurality of reaction wheel assemblies.

12. (Withdrawn) A satellite comprising:

a plurality of reaction wheel assemblies configured to provide attitude for the satellite;

a plurality of gimbaled thrusters; and

flight logic configured to control the plurality of reaction wheel assemblies and the plurality of gimbaled thrusters;

wherein during an orbit transfer, the flight logic directs the plurality of reaction wheel assemblies to provide proper attitude for the satellite and uses the plurality of gimbaled thrusters to control the total momentum of the satellite, the total momentum including the momentum associated with the plurality of reaction wheel assemblies.

13. (Withdrawn) The satellite of claim 12 wherein using the plurality of gimbaled thrusters to control the momentum associated with the plurality of reaction wheel assemblies during the orbit transfer results in minimal gimbal stepping.

14. (Withdrawn) The satellite of claim 12 wherein the flight logic resides on a computer-readable medium executable by a processor onboard the satellite.

15. (Withdrawn) The satellite of claim 12 wherein the flight logic includes:

a reaction wheel control module configured to control the plurality of reaction wheel assemblies; and

a maneuver control module configured to use the plurality of gimbaled thrusters to control the momentum associated with the plurality of reaction wheel assemblies during the orbit transfer.

16. (Withdrawn) The satellite of claim 15 wherein the maneuver control module further includes a momentum adjust module and a gimbal module;

wherein the momentum adjust module is configured to receive information relating to the speed of the plurality of reaction wheel assemblies and a momentum command as input and generate a plurality of outputs including a first output relating to a reaction wheel momentum adjust torque, a second output relating to a thruster momentum adjust torque and a third output relating to an integral momentum adjust torque;

wherein the gimbal module is configured to use the second and third outputs from the momentum adjust module to generate a plurality of outputs including a first output relating to a torque deficit and a second output to be used to control the plurality of gimbaled thrusters; and

wherein the reaction wheel control module is configured to use the first outputs from the momentum adjust module and the gimbal module respectively to generate an output to be used to control the plurality of reaction wheel assemblies.

17. (Withdrawn) A method for providing attitude control with respect to a spacecraft having a plurality of reaction wheel assemblies and a plurality of gimbaled thrusters, comprising:

issuing instructions to the plurality of reaction wheel assemblies to effect a desired attitude for the spacecraft during an orbit transfer; and

issuing instructions to the plurality of gimbaled thrusters to commence operations to control the total momentum of the spacecraft in order to maintain the desired attitude, the total momentum including the momentum associated with the plurality of reaction wheel assemblies.

18. (Withdrawn) The method of claim 16 wherein the plurality of gimbaled thrusters include a plurality of gimbaled Hall Current thrusters (HCTs).

19. (Withdrawn) The method of claim 18 wherein using the plurality of gimbaled HCTs to control the momentum associated with the plurality of reaction wheel assemblies results in minimal HCT gimbal stepping.

20. (Withdrawn) The method of claim 17 wherein the spacecraft includes a satellite.

21. (Withdrawn) Flight software having one or more instructions configured to execute the method as recited in claim 17, wherein the flight software resides on a computer-readable medium executable by a processor onboard the spacecraft.

22. (Withdrawn) A method for providing attitude control with respect to a satellite having a plurality of reaction wheel assemblies and a plurality of gimbaled thrusters, comprising:

firing the plurality of gimbaled thrusters during an orbit transfer; and

using information relating to the speed of the plurality of reaction wheel assemblies and a momentum command during the orbit transfer to generate a first command to be used to adjust the plurality of reaction wheel assemblies to effect a desired attitude for the satellite and a second command to be used to adjust the plurality of gimbaled thrusters to control the momentum associated with the plurality of reaction wheel assemblies so as to maintain the desired attitude.

23. (Withdrawn) The method of claim 21 further comprising:

using the information relating to the speed of the plurality of reaction wheel assemblies and the momentum command during the orbit transfer to generate a plurality of control signals including a first control signal relating to a reaction wheel momentum adjust torque, a second

control signal relating to a thruster momentum adjust torque and a third control signal relating to an integral momentum adjust torque;

using the second and the third control signals to generate a fourth control signal relating to a torque deficit and the second command to be used to adjust the plurality of gimbaled thrusters; and

using the first and fourth control signals to generate the first command to be used to adjust the plurality of reaction wheel assemblies.

24. (Withdrawn) Flight software having one or more instructions configured to execute the method as recited in claim 22, wherein the flight software resides on a computer-readable medium executable by a processor onboard the satellite.